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| 10/583,266  | 09/14/2006  | Rajasingham Satgurunathan | 4662-204            | 2552             |
| 23117 7590 12/08/2010<br>NIXON & VANDERHYE, PC<br>901 NORTH GLEBE ROAD, 11TH FLOOR<br>ARLINGTON, VA 22203 |             |                           |                     |                  |
| EXAMINER  |             |                           |                     |                  |
| GRESO, AARON J  |             |                           |                     |                  |
| ART UNIT  |             | PAPER NUMBER              |                     |                  |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/583,266

**Applicant(s)**

SATGURUNATHAN ET AL.

**Examiner**

AARON GRESO

**Art Unit**

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 September 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/22)
- Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

A reply to the Applicants' arguments is presented after addressing the Claims.

References previously cited are provided in a previous Office Action.

### ***Claim Rejections - 35 USC § 103***

Claims 1-9, 12-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Overbeek et al. (GB 2 362 387) in view of Pears et al. (WO 93/24551).

As to Claims 1-2:

Overbeek et al. teaches aqueous coatings (1:5-10) comprising an acrylic polymer with a Tg of at least 20°C and a chain-extended polyurethane (1:30-37). The polyurethane and acrylic polymer are present in a ratio of from 3/97 to 55/45 (15:5-10). The polyurethane has an acid value of less than 35 mgKOH/g (2:1-10) and is formed from an isocyanate-terminated prepolymer and an active hydrogen chain-extending compound (2:1-10). The prepolymer is made from polyisocyanate (2:1-10), a polyol having a molecular weight of 500 to 8000 g/mol (5:15-25), optionally a polyol having molecular a weight below 500 (6:10-15), and a polyol component having an acid group such as DMPA (7:10-25).

As the acid number of less than 35 mgKOH/g overlaps with the claimed 8 to 40 mg KOH/g, it is understood that the amount of DMPA will overlap with the claimed amount, as acid number is directly related to the amount of acid group containing

reactant. Furthermore, since Overbeek teaches that the NCO:OH ratio is 1.6:1 to 2.3:1 (8:39), which overlaps with the preferred ratio of 1.6:1 to 2:1 (¶0074 of instant specification), and the claimed molecular weights of the reactants are the same as those taught in Overbeek, the claimed percentages of polyisocyanate and polyol components are taken to overlap.

Overbeek is silent as to the claimed amount of ring structure and hard segment content.

However, Pears et al. teaches that when polyurethanes comprise polyester polyols which incorporate low molecular weight cycloaliphatic polyols as well as low molecular weight cycloaliphatic polyols (9:20-40), excellent chemical, water, solvent, and stain-resistance can be achieved (4:10-30). A preferred low molecular weight cycloaliphatic polyol is cyclohexane dimethanol (1:5-15).

As Overbeek also teaches that cyclohexanedimethanol may be used as a polyester precursor (5:30-35) as well as a low molecular weight polyol (6:10-15), Overbeek and Pears are analogous art because they are from the same field of endeavor, namely polyurethane vinyl hybrid dispersions.

At the time of the invention a person of ordinary skill in the art would have found it obvious to have chosen cyclohexanedimethanol, as taught by Pears, in the invention of Overbeek, in order to increase the chemical, water, solvent, and stain resistance of the coating. By using cyclohexane dimethanol, the claimed ring structure content and hard segment content would be achieved, as ring structure is part of the hard segment.

Overbeek is silent on the moisture vapor transmission rate.

On the other hand, while all of the claimed effects or physical properties are not accentuated by the reference(s), the reference(s) teaches all of the claimed ingredients. Therefore, the claimed effects and physical properties, i.e. an MVTR of less than  $500\text{g/m}^2/24\text{h}$  would implicitly be achieved by a composite with all the claimed ingredients. If it is the applicant's position that this would not be the case: (1) evidence would need to be provided to support the applicant's position; and (2) it would be the Office's position that the application contains inadequate disclosure.

Further as to Claim 3: Overbeek et al. teaches the polyurethane having a weight average molecular weight of 40,000 to 1,500,000 g/mol (11:35-39).

Further as to Claims 4-5: Overbeek et al. teaches preferred vinyl monomers being 2-ethylhexylacrylate (12:21), styrene, and acrylonitrile (12:33), which meet the claimed limitations. Additionally, as these are the same monomers as are preferred in the instant invention (§0085 of instant specification), they will also be understood to meet the claimed acid value of less than 10 mg KOH/g.

Further as to Claims 6-7: Overbeek et al. teaches the vinyl polymer formed of two polymers formed sequentially (3:25-35) as well as the difference in T<sub>g</sub> being at least 30°C (1:30-35).

Further as to Claim 8: Overbeek et al. teaches the weight average molecular weight of the acrylic polymers being from 100,000 to 1,500,000 g/mol (13:25-30).

Further as to Claim 9: Overbeek et al. teaches the vinyl polymer(s) being prepared in the presence of the polyurethane polymer (3:35-40).

Further as to Claim 12: Overbeek is silent on the stain resistance value. However, as Pears teaches that using cyclohexanedimethanol increases stain resistance (4:10-30), it is understood that the coating will achieve the claimed stain resistance, as the composition is the same.

Further as to Claims 13-14: Overbeek et al. teaches the dispersions comprising pigments (15:10-15), but is silent on the amount of pigment. However, the experimental modification of this prior art in order to ascertain optimum operating conditions renders applicants' claims unpatentable in the absence of unexpected results. MPEP 2144.05. The amount of pigment controls the color and hue of the coating. Consequently it would be obvious to optimize to achieve the desired aesthetics.

Further as to Claim 15: Overbeek et al. teaches a dispersion being substantially solvent-free (2:19-25).

Further as to Claims 16-17: Overbeek et al. teaches neutralizing the pre-polymer before, during, or after dispersion (7:20-25), followed by chain extension (9:20-25). The acrylic polymers may be present as a blend of preformed polymers or may be prepared in-situ in the presence of the polyurethane polymer (3:25-40).

Further as to Claims 18-22: Overbeek et al. teaches that the dispersions may be used as films or coatings for wood (15:10-20).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have employed the teachings of Pears et al., applicable to including stain resisting cyclohexanedimethanol, to the compositions taught by Overbeek et al., for

coatings with optimized amounts of pigments, ready for improvement, with a reasonable expectation of success.

Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Overbeek et al. (GB 2 362 387) in view of Pears et al. (WO 93/24551), as applied to claim 1 above, and further in view of Grandhee (US 6,342,558).

As to Claims 10-11:

Although Overbeek et al. teaches the basic claimed composition as set forth above, while also suggesting that compositions comprise acrylic and polyurethane materials (page 2 lines 28-34 and pages 2-3 bridging paragraph), formation of the acrylic polymer component, Overbeek does not further accentuate applications comprising a radiation curable multifunctional material.

On the other hand, Grandhee teaches polyurethane acrylic hybrids (ABS) wherein the acrylic dispersion may comprise monomers such as trimethylolpropane triacrylate in order to partially crosslink the acrylic (5:50-60).

Overbeek and Grandhee are analogous art because they are from the same field of endeavor, namely polyurethane vinyl hybrid dispersions.

At the time of the invention a person of ordinary skill in the art would have found it obvious to have used trimethylolpropane triacrylate, as taught by Grandhee, in the invention of Overbeek, ready for improvement; in order to partially crosslink the acrylic dispersion, resulting in increased hardness. As trimethylolpropane triacrylate is a multifunctional acrylate monomer, it meets the claimed limitations.

***Response to Arguments***

Applicant's arguments filed 30 September 2010 have been fully considered but they are not persuasive.

Applicant argues:

A) Examiner employs hindsight {page 8, first full paragraph} because:

Overbeek et al. does not teach cyclohexanol dimethanol and motivation is lacking to combine Overbeek et al. with Pears et al.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

In addition, as the references suggest materials applicable to those claimed, and as the references provide a means of use or application, that are the same or similar to the materials and applications claimed, it would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to have selected various combinations of active materials and polymeric substances from within the disclosure of the references to arrive at the compositions yielding no more than one would expect from



such an arrangement with a reasonable expectation of success. {KSR v. Teleflex, 127 S.Ct.1727, 1740 (2007)}

B) Pears et al. (WO 93/24551) does not teach compatible art with Overbeek et al. (GB 2362387) {pages 8-9, first full paragraph} because:

i) Overbeek et al. teaches a delicate balance was found to solve a problem and that an ordinarily skilled artisan would be taught not to upset a balance and would be de-motivated to change Overbeek et al. teachings.

In response, Overbeek et al. teaches to provide for compositions enable substantially solvent-free applications for achieving a low "MFFT" or minimum film forming temperature (Overbeek, page 1 lines 13-29); the teachings overcome problems associated with flammability. Compositions are only required to comprise less than 5% solvent with an aqueous dispersion (page 2 lines 19-27) {taken as being up to but less than 5%) as the compositions are required to only be substantially solvent free (ibid.).

ii) Overbeek et al. teaches employing solvent free compositions while Pears et al. teaches compositions that can comprise solvents

In response, although Overbeek et al. teaches solvent free compositions (Abstract), the reference also teaches of aqueous multi-polymer dispersions (Overbeek et al., Abstract); Pears et al. also teaches polyurethane dispersions with copolymers (Pears et al., Abstract and Title). Pears et al. further teaches employing compositions with water and, or, organic solvents (Pears et al. page 20 lines 1-2); as such, Pears et al. does not require solvents; this provides the reader an option to either only use water,

as would be applicable to Overbeek et al., while further allowing for the use of solvents when employing additional features of the Pears et al. compositions.

C) Grandhee (US 6342558) does not remediate deficiencies in Pears (WO 93/24551) and Overbeek (GB 2362387) rejections {page 9}.

In response, as Pears and Overbeek are shown not to be deficient, rejections with Grandhee still apply.

The rejections are held.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

***Examiner Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AARON GRESO whose telephone number is (571)270-7337. The examiner can normally be reached on M-F 0730-1700.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Milton Cano can be reached on 571 272 1398. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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